

Education

MANITOBA

Volume 10
Number 1
October 2011

Published by School Programs Division (Kindergarten to Grade 12) of Manitoba Education

Engaging All Students in the Science of Tomorrow A Message from the Minister

Scientific progress is dynamic and constantly extending to new frontiers. Human knowledge has developed at an ever-increasing rate and technology has advanced accordingly. Science educators are challenged to guide their students through this changing landscape and to help them improve their understanding of the world.

Manitoba Education, in partnership with various educational stakeholders, is addressing this challenge by initiating a new *Action Plan for Science Education in Manitoba*.

The action plan includes a \$25 million science classroom renewal program to refurbish approximately 12 to 15 high school science classrooms per year, with the potential for 75 science classrooms over the five-year duration of the program. Upon the completion of renovations, schools will be able to access the Science Enrichment Technology (SET) grant of up to \$25,000 to purchase state-of-the-art lab equipment, such as interactive whiteboards, planetarium software,

biomedical testing equipment, advanced digital microscopes, and green energy technology.

The plan also provides educators with continuing supports for professional learning so they are able to encourage and improve student engagement in science. When students understand and can discuss current issues in science and use their scientific literacy skills to interpret technical information effectively, they are better able to make informed decisions, accommodate rapid change, and create new knowledge.

The *Action Plan for Science Education in Manitoba* will help ensure that high school students have access to the best labs and equipment, and benefit from a science curriculum that responds to changing needs. It will provide educators with tools, strategies, and professional support structures to engage students in science and help them understand the need for new innovations to promote an environmentally, socially, and economically sustainable society.

Initiatives included in the action plan are designed not only for students who are already succeeding, but also for those students

who may not be fully engaged with science as an area of personal or educational interest. It is intended to improve all students' learning and achievement.

Students' views of science have been shaped by their classroom experiences. However, they may also have preconceived opinions on who might choose science as a career path and on the importance of science in their lives. Science teachers need to help students re-imagine how they think of science, as well as how they think of the natural world from a scientific perspective.

Manitoba Education recognizes the significant influence and crucial role that teachers have in encouraging students to study science. Teachers connect students to the relevance of science in their lives and help them develop a sense of the many opportunities that are open to them. New professional growth opportunities for our teachers will be instrumental in implementing effective teaching and learning practices that favour student success in the sciences.

Through this renewed commitment to science education in Manitoba, students and their families will have the opportunity to engage in a world of change, and we will all be better able to understand the pivotal role of science education in a future of great promise. Further information on the *Action Plan for Science Education in Manitoba* can be found at www.edu.gov.mb.ca/k12/cur/science/action_plan/index.html.

Nancy Allan
Minister of Education

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Student Success with Distance Learning

By Myrna Klassen, with Debbie Cousin and Sharon Doerksen

The Distance Learning Unit of Manitoba Education offers a variety of both compulsory and elective courses that are useful options for many Grades 9–12 students.

Students take Independent Study Option (ISO) courses for a variety of reasons. These include the need to fulfill graduation requirements that cannot be accommodated within the timetable of their school, to obtain a missing prerequisite for a specific post-secondary program, or to take particular courses that interest them but are unavailable in their school. The improved range of options and the flexibility allowed in the ISO program is beneficial for all students, especially those who live in rural Manitoba.

Learning through independent study is a useful skill that will benefit students for life. Workplace training often requires some form of distance learning, whether it is training in the financial

services or in automotive technology. Taking a distance learning course in high school is great preparation for lifelong learning in the future.

Debbie Cousin is an ISO school facilitator and school counsellor in two K–12 rural schools: Westmount School Complex and École Somerset School. She supports parents and students by showing them which courses are available, and explaining what will be expected of them in their successful completion of the course. Her role also involves directing students to the distance learning website (see <www.edu.gov.mb.ca/k12/dl/>) so they can preview the courses at home. She guides them through the course, helping them contact tutor/markers, find resources, and arrange for examinations.

Sharon Doerksen is the ISO school facilitator and a counsellor at Stonewall Collegiate. She provides guidance and support to up to 45 students each school year as they complete their ISO courses. Sharon also advises students on their course selections and on the suitability of their learning style for ISO. Students need to be self-motivated and committed to be successful in independent study. Sharon tells her students that ISO courses are not “easy credits.”

Once registered, students submit their assignments through the ISO school facilitator, who orders and supervises exams. Sharon also holds periodic individual meetings with students, and students are encouraged to establish timelines and develop strategies to complete their work.

Communication with parents is also important for student success, so parents of all students registered in ISO courses at Stonewall Collegiate receive memos with their school report cards. The memo contains the ISO course deadline, due dates for assignments, and the exam schedule for the year, as well as the student's progress report, which is also available upon request.



Support provided by the Distance Learning Unit also helps students to find success in ISO courses. Tutor/markers make contact with students and are available to assist them when needed, and students are able to resubmit each assignment once to improve their marks. Being able to register for courses at any time, as well as having a full year for completion, allows for additional flexibility. Independent study meets the needs of a wide range of students with the support of the Distance Learning Unit and ISO school facilitators.

For more information regarding the ISO program and for additional strategies to help students at your school complete distance learning courses, please contact Myrna Klassen, Distance Learning Consultant. Telephone: 204-325-1711. Toll-free: 1-800-465-9915. Email: myrna.klassen@gov.mb.ca

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- ▶ Grade 12 Active Healthy Lifestyles
- ▶ Grade 12 Psychology

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Curriculum Update

Several projects are underway in the 2011/2012 school year to develop, revise, and implement new curricula for the Kindergarten to Grade 12 English Program.

The Instruction, Curriculum and Assessment Branch continues to provide workshops for curriculum implementation and related professional learning. Information about workshops is posted on the workshop registration system at <<http://web16.gov.mb.ca/workshops/>>.

For a list of compulsory curricula and stock numbers for ordering from the Manitoba Text Book Bureau, refer to <www.edu.gov.mb.ca/k12/cur/csai.html>.

Reorienting Manitoba Teacher Education to Address Sustainable Development

By Carolee Buckler

Institutions of teacher education serve as key change agents in preparing teachers in learning for sustainability and in making changes that will shape the knowledge and skills of future generations.

In Manitoba, faculties of education not only train our teacher candidates, they provide professional development for in-service teachers, produce research, and work with schools and other educational stakeholders. Faculties of education are therefore well positioned to assist in bringing about systemic change that will promote a culture of education for sustainable development (ESD) in Manitoba.

Universities and colleges in Manitoba have demonstrated changes with regard to sustainability. The introduction of campus-wide sustainability policies has resulted in more sustainable practices regarding the management of water and energy use, waste management such as recycling, the efficiency of building designs, as well as the integration of sustainability into the cultural fabric and governance structure of the institutions. It is within the context of

these institutional commitments that some faculties have begun to examine their own policies and programs as they relate to sustainable development.

Manitoba Education has partnered with the faculties of education

to engage in discussion, reflection, and action towards preparing teacher candidates to assist students in obtaining the knowledge, skills, perspectives, and values that will guide and motivate them to work and live in a sustainable manner. In November 2009, Manitoba Education, in partnership with Learning for a Sustainable Future (LSF) and the deans of education, hosted a seminar for faculty members that focused on exploring what ESD means for faculties of education in Manitoba. This was the first time that deans and other members of the various faculties of education gathered to discuss ESD. As a result of this seminar, a committee was formed of faculty of education representatives from all of the institutions. This committee is tasked with developing recommendations for the deans of education and Manitoba Education to consider.

The work of the committee to date has clearly shown that faculties of education are engaged in a wide variety of activities in teaching, research, and outreach related to ESD. For example, the University of Manitoba designed a Summer Institute on education for sustainability and is also offering courses in ESD at the graduate level. The University of Winnipeg has also recently announced its sustainability education post-baccalaureate diploma. Some faculties have begun infusing ESD into their curricula, providing professional development in ESD for their faculty members, and conducting research in ESD. Establishing the committee has provided an opportunity for faculty of education members to learn from one another, reflect on and improve existing practices, and support new ideas.

The committee is in the process of developing recommendations based on a survey of how Canadian faculties of education are incorporating ESD into their pre-service programs. By working together in a collaborative way, the committee is building upon existing ESD momentum and action within the faculties of education.

For more information, contact
Carolee Buckler
ESD Coordinator
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Toll-free: 1-800-282-8069, ext. 1924
Email: carolee.buckler@gov.mb.ca

Curriculum	Curriculum Implementation Dates	Systemic Implementation Dates
Arts Education K-8	2008-2011	2011-2012
Grade 11 Applied Mathematics	2009-2011	2011-2012
Grade 11 Essential Mathematics	2009-2011	2011-2012
Grade 11 Pre-Calculus Mathematics	2009-2011	2011-2012
Grade 12 Applied Mathematics	2010-2012	2012-2013
Grade 12 Essential Mathematics	2010-2012	2012-2013
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Grade 11 History of Canada	2009-2011	2011-2012
Grade 12 Global Issues: Citizenship and Sustainability	2011-2012	2012-2013
English as an Additional Language: Stages 1-2 (Senior Years)	2011-2012	2012-2013
English as an Additional Language: Across the Curriculum Stage 3 (Senior Years)	2013-2015	2015-2016
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Curriculum	Curriculum Implementation Dates	Systemic Implementation Dates
English as an Additional Language: Literacy, Academics, and Language 2 (Grade 9)	2011-2013	2013-2014
Carpentry: 9	2012-2013	2013-2014
Design Drafting: 9	2014-2015	2015-2016
Print Media: 9	2012-2013	2013-2014
Culinary Arts: 9	2012-2013	2013-2014
Cosmetology: Hairstyling: 9	2012-2013	2013-2014
Automotive Technology: 9	2013-2014	2014-2015
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Engaging with Science: An Action Plan for Science Education in Manitoba

By John Murray
Science Consultant (until July 2011)

Scientific inquiry not only helps us learn about our world, it allows us to understand more about ourselves and the influence of science on our personal views of the natural world.

Science in the classroom has traditionally focused on the content and processes of science, and emphasized its contribution to human understanding. Now, as our understanding of the world changes and grows, so do our views on what constitutes a sound educational

foundation in science. Educators must strike a balance between providing the foundations of scientific knowledge and examining how science has a personal and social relevance to students.

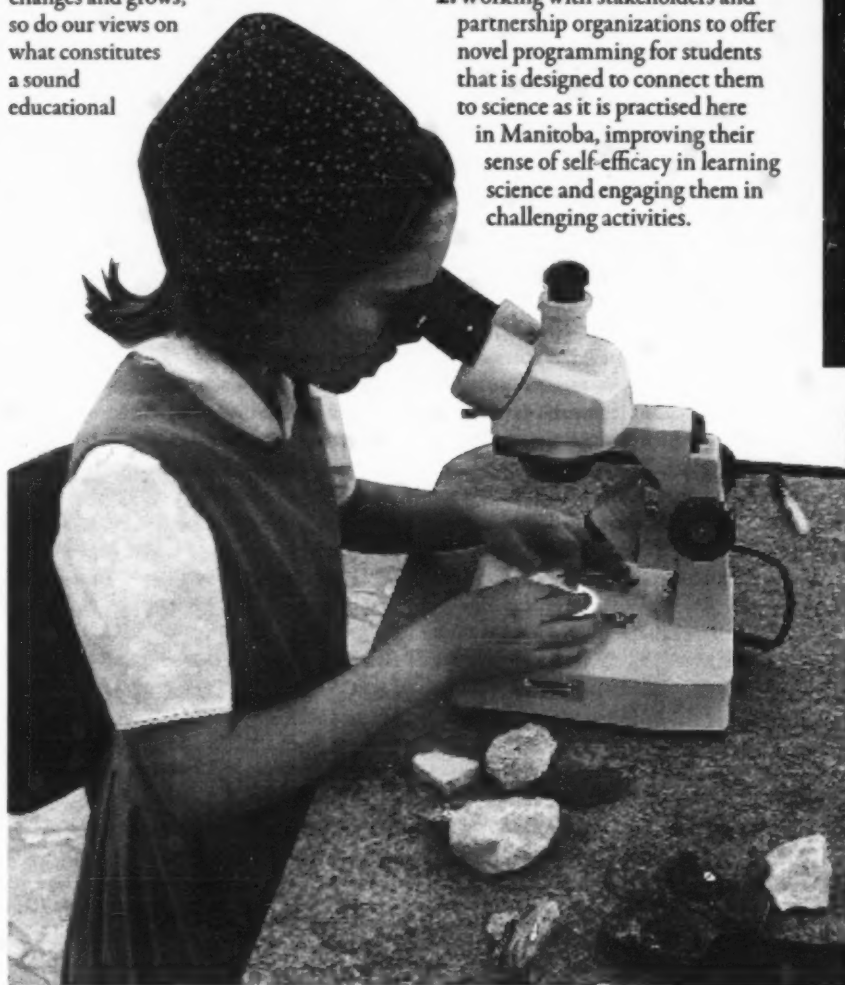
To achieve this balance, Manitoba Education has initiated its *Action Plan for Science Education in Manitoba*, which has two priorities:

1. To provide science educators in the province with professional learning opportunities that directly support improved teaching practices and foster a greater likelihood of positive outcomes among students and better engagement in their learning of science.
2. Working with stakeholders and partnership organizations to offer novel programming for students that is designed to connect them to science as it is practised here in Manitoba, improving their sense of self-efficacy in learning science and engaging them in challenging activities.

Manitoba Education wants students to understand that what they are learning in science is both immediately and potentially relevant, and that maintaining an engagement with school science can lead to satisfying and challenging career opportunities. The *Action Plan for Science Education in Manitoba* is intended to support educators and foster partnerships as well as engage students and encourage academic success.

The action plan will provide the basis for student success by

- enhancing opportunities for students to acquire the knowledge, values, attitudes, skills, and experience needed to gain a deep understanding of the world around them
- supporting schools and school divisions in their efforts to engage students in science education in schools and communities
- working closely with teachers in their efforts to increase student participation/success in science through programming and curricular activities related to science, and increase their awareness of in-demand career opportunities in this field



Education research consistently demonstrates that teachers and school leadership are among the most important in-school factors related to improved student engagement and success. Manitoba Education is putting in place key supports for educators, including offering opportunities for professional learning. The provision of these supports favours working in partnerships among a variety of organizations to enhance our collective capacity to offer high quality science education.

Students who are not inspired and motivated by school will generally learn and achieve less than those who are. Manitoba Education is working with school divisions and other partners to enhance student engagement in science so that the curriculum and how it is delivered are as relevant to students' needs as possible. The student engagement initiatives also include creating the conditions that are necessary for students to be more successful.

Through the action plan, schools may apply for the following science grants to support student activity:

Scientists in the Classroom: Grant Program

This program, which has been in effect since 2006, will continue and has been expanded to include all Kindergarten to Grade 12 classes for 2011/2012.

Middle Years Experiential Learning Grant

This grant helps Manitoba school divisions establish projects to provide learning opportunities for students to help them apply their science lessons to their daily lives, thereby strengthening their connections to school.

Education for Sustainable Development (ESD) Grants

Manitoba Education and Manitoba Hydro have offered grants of up to \$2,000 to help teachers and schools incorporate sustainable development themes into their curricula. Manitoba also provides grants of up to \$700 per school to school divisions to ensure school policies, programs, and support for ESD.

The action plan will promote and provide support for youth involvement in science activities and programs such as Manitoba Mindset activities, Manitoba Envirothon, and the Youth Encouraging Sustainability (YES) showcase. As Manitoba is the host of the 2012 International Students' Science Fair, there will be an opportunity for students and teachers to make international

The action plan will strengthen our efforts to better connect students and their teachers with science by

- providing educators with new tools and access to community-based science facilities in order to engage students more fully in science experiences

- assisting teachers in their efforts to use effective strategies when teaching science through collaborative learning environments

- supporting structures (professional learning communities, conferences, organizations) focused on the development of improved teacher efficacy and engagement in the teaching of science

- fostering the development of partnerships in delivering science programming to build and enhance science literacy in Manitoba



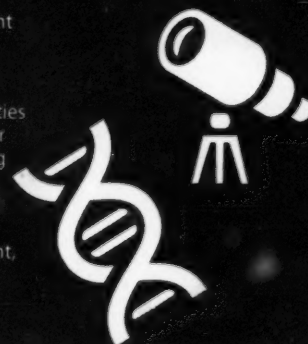
connections to youth science from among the 17 countries that are expected to attend.

Manitoba Education is also providing and promoting resources for students to increase their interest and success in science, and to develop awareness of career choices and educational opportunities in the field of science. There are a host of opportunities available to our dedicated science educators and students as the *Action Plan for Science Education in Manitoba* unfolds. For further information on how to be involved in the action plan, see <www.edu.gov.mb.ca/k12/cur/science/action_plan>.

The action plan will further support the implementation of the K to 12 science education curriculum in Manitoba by

- providing curriculum-aligned teaching resources and identifying quality science resources aligned with Manitoba curricula
- providing teacher professional development opportunities
- promoting science development opportunities offered by partners/other organizations developing an interactive website where teachers can find information about professional development, have discussions, share ideas, and work towards building an online

community partnering with a number of organizations (e.g., the Science Teachers' Association of Manitoba, FortWhyte Alive!, the Inner City Science Centre, Manitoba Mindset, and the St. Boniface Hospital Research Centre) to help promote and/or develop high quality programming for students that is experiential in its design.



Motivating Students the Career Trek Way

By Meryl Kaye De Leon

Director of Community Relations, Career Trek

I imagine if you could learn and experience up to 80 different occupations. That's exactly what 600+ students in Manitoba are embarking on as they take part in Career Trek's 2011/2012 programming year.

"We strongly believe that if we want students to know what they want to be when they grow up, they need to try it first," says Darrell Cole, Executive Director of Career Trek. "We understand that to motivate these students, we need to show them where their efforts will lead them."

Students as young as 10 years old from across Manitoba will be given access to post-secondary institutions to gain hands-on experience with up to 80 careers in as many as 17 different career fields.

Former participant Brenlee Johnstone credits Career Trek for teaching her life and career skills. "It helped me to apply school to the real world. It made a huge impact," says Brenlee.

"I would not be the same person without it. It allowed me to build confidence in myself and what I like and don't like."

Brenlee was one of hundreds of students who attended Career Trek every Saturday, and she says that experience taught her the importance of commitment and responsibility. Brenlee is currently enrolled in the Joint Deaf Studies Program at Red River College and University of Manitoba.

"I would be so lost," says Brenlee. "Without Career Trek, I probably wouldn't have the confidence to try anything new. I would have no idea what I would want to do."

Career Trek works to provide these learning opportunities for students across Manitoba with six programs and projects. Students gain access to post-secondary institutions such as the University of Manitoba, The University of Winnipeg, Red River College, and Winnipeg Technical College in Winnipeg. In its province-wide projects, Career Trek provides students with access to Brandon University, Assiniboine Community College, Manitoba Emergency Services College, and University College of the North.

For more information, visit www.careertrek.ca.

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A History

Written specifically for
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- Reflect...Recall...Respond questions provide students with opportunities for self-assessment
- Shaping Canada Today helps students make connections between history and contemporary Canada
- Viewpoints on History encourages students to explore, examine, and evaluate various points of view on a specific topic or issue in history
- History in Action develops and expands understanding of the people and events of the period
- Historical Thinking Competencies are seamlessly interwoven throughout the student text and are reinforced through questions and activities

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Lost Prizes at Home and Abroad

By Ken McCluskey

In the early 1990s, the Lord Selkirk, Sunrise, and Interlake school divisions established Lost Prizes, an initiative to reclaim at-risk, talented high-school dropouts who had essentially been lost to the system. Most of these students had withdrawn and were unproductive, and some were in trouble with the law. Lost Prizes was a way to reconnect with these individuals, awaken their dormant creative potential, and motivate them to do something more productive with their lives.

During the first part of the Lost Prizes program, a facilitator worked directly with the participants in an off-site classroom setting. The classes featured various strength-based interventions, career awareness, and creative problem solving (CPS) training. Using CPS tools, the re-engaged students learned to make reasoned educational, career, and life decisions, and considered how to move from their "current reality" to a "desired future state." They mapped out individual growth plans to help identify and work toward goals. In the second phase, students gained experience through on-the-job placements, and had an opportunity to encounter and address some real-life problems with caring, philanthropic mentors in the business community.

Lost Prizes was very successful. Once their talents were identified, appreciated, and nurtured, 57 of the 88 participants (65 percent) responded by returning to high school, entering post-secondary programs at university or community college, or obtaining employment. A similar format has been successfully used to increase graduation rates among at-risk Aboriginal students and to reduce recidivism among inmates.

By 1999, the original Lost Prizes and related made-in-Manitoba initiatives ended, but interest in the projects remained and similar programs were established in the three original divisions. This year, faculty at the University of Winnipeg (UW) collaborated with educators in the field to launch new incarnations of the program at the Manitoba Youth Centre and at Sisler High School.

Lost Prizes weds theory and practice from both the enrichment and at-risk domains. Currently, with support from UW faculty and staff, a vision is emerging that features three levels of Lost Prizes intervention:

- Lost Prizes training centres that provide the facilities, materials, and human resources necessary to train new practitioners.

- Programs that involve trained practitioners using the Lost Prizes philosophy and approach directly in their work with young people.
- Schools that embody and practise Lost Prizes principles at all levels throughout the institution.

The effects of these efforts can be seen in a number of interesting new ventures. In Thailand, a new Lost Prizes free school called Por Peang (i.e., "self-sufficiency") will soon be built for village children in Buriram, and a prototype demonstration centre is also being planned for Bangkok. Projects in other sites in Asia may follow. Kenya will soon be opening a Lost Prizes school and program in Nairobi and a training centre in Kisumu. Planning sessions were held in July to follow up on earlier discussions and interest in Jordan, India, Turkey, Israel, Cuba, Mexico, and Peru.

Everyone involved in Lost Prizes outreach understands the importance of concrete training and preparation. To meet this need, 25 UW foundation and support courses/workshops—each three full days in length (i.e., 1.5 credit hours)—have been developed to help educators acquire basic competencies and certification. Subject to university approval, the Lost Prizes courses may be counted as electives toward the Bachelor of Education degree or, alternatively (if extra assignments are completed), toward the Post-Baccalaureate Diploma in Education.

The goal of the programs has always been to improve the talent identification and development process. Once educators are equipped with appropriate training, skills, commitment, and experience (in both the enrichment and at-risk areas), they strive to identify and nurture the gifts of these highly capable, but disconnected children and youth. While there are always new challenges to address, they approach them with hope, flexibility, and perseverance. As a result, a lot of young people who have been otherwise marginalized now have the potential to make incredible contributions to societies around the world.

Profile

Dr. Ken McCluskey, Dean and Professor of Education at the University of Winnipeg, is known internationally for his work in mentoring, attention-deficit/hyperactivity disorder, at-risk children and youth, and gifted education. Before becoming a professor (in 1998) and Dean of Education (in 2003) at U of W, Ken had 25 years experience as a psychologist, special educator, and administrator in the public school system. He has received major program development, creativity, and publication awards from the Canadian Council for Exceptional Children, the International Centre for Innovation in Education, the World Council for Gifted and Talented Children, and Reclaiming Youth International. Ken has written over 100 professional articles and chapters, and is the author, co-author, or editor of 20 books, including *Understanding ADHD: Our Personal Journey*, *Lost Prizes: Talent Development and Problem Solving with At-Risk Populations*, *Mentoring for Talent Development*, and *Enriching Teaching and Learning for Talent Development*.



The Marsville Program Lifts Students to a New World

by John Murray

In April 2011, hundreds of Manitoba Grade 6 students and their teachers came together to showcase visions of what it might be like to set up a human presence on Mars.

For almost 20 years, the Canadian National Marsville Program has brought together students from across Canada in an attempt to simulate a habitable colony on another world. During this time, some 3,000 students, 42 Manitoba schools, and 90 teachers have been involved. The National Research Council of Canada has been the coordinating body for Marsville since 2006.

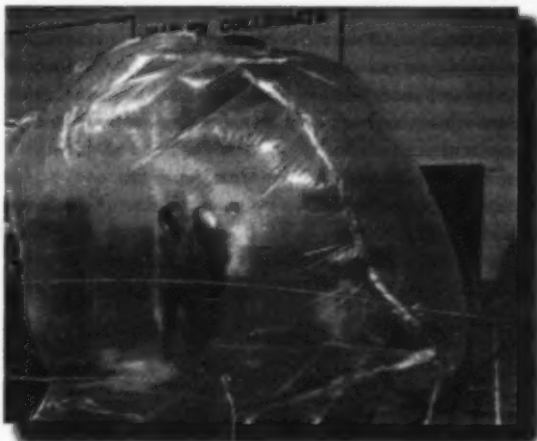
The 1988 space shuttle Challenger accident, which claimed the life of eight NASA astronauts including Christa McAuliffe who was to be the first K-12 teacher in space, laid the foundations of a program that has become a tribute to space exploration, teacher dedication, and student ingenuity. It is this spirit of intrepid exploration of a hostile environment that provides students with the challenge of creating life support systems that will allow for living beyond Earth.

Here in Manitoba, the Marsville program is sponsored by MindSet – a network for science and technology outreach. Since its inception, Jeff Cieszecki of Seven Oaks School Division has been on the ground at Marsville Mission Control, assisting teachers in their quest to bring the excitement of space science and research into the school curriculum. Students are prepared for their experiences on Mars by receiving a foundation in space exploration and the characteristics of the planet Mars. The journey to Mars officially begins each year on January 28th (the anniversary of the Challenger launch) as teams of students design, build, and assess life support systems and waste management

considerations. For 60 days, these student teams take on the task of developing a successful mission to Mars that includes the design of a logo patch, communicating with other teams across Canada through a team blog, and building one of the nine life support systems that make up the sustainable Martian colony. These systems include air and water, communications, energy, food, health and recreation, temperature control, transportation, and waste management.

Teachers provide leadership at the school level for Marsville, and recruit volunteer scientific and engineering mentors who can offer critical guidance to the student teams. These "mission specialists" can offer direction as to where the best available information and resources are to be found, and help the students stay on a manageable course of design and build.

The Marsville program culminates in a national "Link Up Day" held on the last school day of April each year. Teams from across Manitoba came to Maples Collegiate this past spring to assemble their Martian habitats and life support systems under student-constructed, class-sized plastic domes. This is the students' "science adventure in a bubble." Every component of the construction – including the big plastic bubble – must have a reuse or recycling plan in place ahead of the Link Up Day. Now that's extraterrestrial living in a sustainable way!



For more information about the Canadian National Marsville Program and how you and your students can get involved for Mars Mission 2012, please contact:

Jeff Cieszecki
Manitoba Coordinator, Canadian National Marsville Program
Seven Oaks School Division
Email: jeff.cieszecki@7oaks.org
If you are looking for online sources for Marsville, see
www.nrc-cnrc.gc.ca/eng/education/marsville/index.html.

Education MANITOBA

ISSN 0704-2671

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Distribution:

Education Manitoba is distributed free to schools in Manitoba. This newsletter can be viewed online at www.edu.gov.mb.ca/k12/newsletter/. A similar document has been developed by the Bureau de l'éducation française Division for the Français and the French Immersion Programs.

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